



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,663	12/28/2001	Tac-Won Lim	1147.40966X00	3642
20457 7590 06/04/2004 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			EXAMINER PARSONS, THOMAS H	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,663

Applicant(s)

LIM ET AL.

Examiner

Thomas H Parsons

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: “34” and “42” as shown on Figure 3. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “24” has been used to designate both a “reactant gas inlet pipe”, on page 5, line 26 and a reactant gas supplying pipe, on page 6, line 3. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

Page 3, lines 2-3, the text “In the conventional humidifier...the fuel cell 5, as shown in Fig. 2” appears awkwardly worded; and,

Line 11, suggest changing “is” to --are--.

Appropriate correction is required.

Claim Objections

4. Claims 1-8 are objected to because of the following informalities:

Claim 1 recites, "1. In a gas supply apparatus for a polymer electrolyte fuel cell system..." whereas claims 2-8 recites "2. The humidifier..."

Suggest amending the preambles to be consistent with each other.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Prior art Figures 1 and 2, and further in view of Blaszczyk et al. (6,699,608).

Claim 1: The Applicants in Prior art Figure of the instant specification disclose a gas supply apparatus for a polymer electrolyte fuel cell system comprising: an inlet pipe (1) through which the reactant gases is supplied from a reactant gas reservoir; a reactant gas flux regulator (2) for adjusting the flow rate of supplied reactant gases; a reactant gas supplying pipe (4) for supplying the humidified reactant gases to the fuel cell; a pressure regulator (7) for adjusting the pressure of reactant gases inside the fuel cell; a coolant regulator (9) for cooling the fuel cell; a fuel cell temperature regulator(10)for adjusting the temperature of the fuel cell; and a humidifier

(3)for humidifying the reactant gases for a polymer electrolyte fuel cell system, said humidifier comprising:

a humidification vessel (17) to which a reactant gas inlet pipe (12) for supplying reactant gas thereto; and a reactant gas supplying pipe (4) for supplying the humidified reactant gases to the fuel cell

The Applicants' Prior Art Figures 1-2 do not disclose a water inlet pipe or a spray.

Blaszczyk et al. in Figure 1 disclose a water inlet pipe (5) for supplying water thereto, and a spray (6) which is installed in the humidification vessel (1) and finely sprays the reactant gases (7) and water supplied to the humidification vessel (col. 2: 40-63). (See also col. 1: 15-33; and, col. 2: 54-col. 5: 17.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of the Applicants Prior art Figures 1 and 2 by replacing humidification vessel Prior art Figures 1 and 2 with the humidification vessel of Blaszczyk et al. because Blaszczyk et al. teach a humidification vessel comprising a water inlet pipe and spray that would have provided a fuel cell with the means for achieving a high humidity or high relative humidity in a gas flow very finely and uniformly dispersing the medium to be evaporated thereby making the evaporation process more efficient.

Claim 2: The rejection is as set forth above in claim 1 wherein Blaszczyk et al. further disclose a humidification vessel provided with a double passage (heat exchanger 3) where a coolant (10) heated by the fuel cell flows (col. 2: 40-63; col. 28-col. 4: 60; and col. 5: 15-17). (See also col. 2: 54-col. 5: 17.)

The recitation “in order to preheat the reactant gases introduced into the reactant gas inlet pipe” has been construed as a statement of intended use that does add additional structure to the apparatus. On col. 3: 65-67 and col. 4: 44-45, Blaszczyk et al. disclose that other heat exchanger arrangements and other nozzle arrangements, as well as the number thereof, can be provided. Therefore, it would have been within the skill of one having ordinary skill in the art to modify the apparatus of the Prior art combination to provide preheating.

Claim 3: The rejection is as set forth above in claim 1 wherein Blaszczyk et al. further disclose a humidification vessel is provided with a double passage (heat exchanger 3), where hot coolant (10) heated by the fuel cell flows.

The recitation “in order to preheat the water introduced into the water inlet pipe” has been construed as a statement of intended use that does add additional structure to the apparatus. On col. 3: 65-67 and col. 4: 44-45, Blaszczyk et al. disclose that other heat exchanger arrangements and other nozzle arrangements, as well as the number thereof, can be provided.

Therefore, it would have been within the skill of one having ordinary skill in the art to modify the apparatus of the Prior art combination to provide preheating.

Claim 7: The rejection is as set forth above in claim 1 wherein Blaszczyk et al. further disclose a humidification vessel further provided with a double passage (heat exchanger 3), where hot coolant (10) heated by the fuel cell flows.

As to the recitation “ in order to heat the humidified reactant gases just after it is sprayed”, the rejection is also as set forth above in claims 2 and 3 .

Claim 8: The rejection is as set forth above in claim 1 wherein Blaszczyk et al. further disclose a reactant gas supplying pipe (8) that a dual pipe designed to allow the coolant heated by

the fuel cell to flow through the exterior passage thereof in order to maintain the temperature and pressure of the humidified reactant gases to be uniform.

7. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Prior Art, and further in view of Blaszczyk et al. as applied to claim 1 above, and further in view of Marino et al. (5,792,390)

The Applicants' Prior art and Blaszczyk et al. are as applied, argued, and disclosed above, and incorporated herein. However, the Applicants' Prior art and Blaszczyk et al. are silent as to a water storage tank, a valve, and a water flux regulator.

Claims 4-6: Marino discloses in Figures 1-3 a water storage tank (60) for storing the water supplied to the spray (col. 1: 30-37; see also col. 1: 38-col. 6: 25); wherein the water storage tank (60) is equipped with a valve (100) capable of replenishing the tank with water without ceasing operation of the fuel cell (col. 6: 26-col. 8: 2); and, wherein the water storage tank is further equipped with a water flux regulator (72) for adjusting the amount of water supplied to the spray so that it can vary the amount of humidification (col. 5: 25-35 and 48-65).

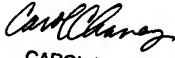
Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of the Applicants' Prior art combination by incorporating the water storage tank, a valve, and a water flux regulator of Marino because Marino teaches a water storage tank, a valve, and a water flux regulator that would have controlled the flow cycle thus ensuring that the humidification device will have a supply of water with which to vaporize, and would have provided an air tight seal of the fill hole thereby improving the overall efficiency and operation of the apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons
Examiner
Art Unit 1745


CAROL CHANEY
PRIMARY EXAMINER
6/1/04